

Table of excessive and greatest monthly precipitation for May, 1886.

Station.	Specially heavy.		Largest monthly.	Amount.	Station.	Specially heavy.		Largest monthly.	Amount.
	Date.	Amt.				Date.	Amt.		
Alabama.					New Jersey—Con.				
Boonoke.....	18	4.05	7.97		Sandy Hook.....	8	3.30	8.46	
Scottsborough.....	6, 7	2.97			Do.....	13, 14	2.00		
Opelika.....	18, 19	2.09			Beverly.....	7, 8	4.16	8.08	
Calera.....	18	2.20			Moorestown.....			6.80	
Livingston.....	18, 19	2.48			Phillipsburg.....	7, 8	2.87	6.24	
Birmingham.....	19	2.06			Upper Montclair.....	8	2.32	6.20	
Auburn.....	18, 19	2.04			Dover.....	8	3.08	6.07	
Carrollton.....	18, 19	2.65			Roseland.....			6.01	
Florence.....	5, 6	2.02			Princeton.....	7, 8	2.42		
Do.....	19, 20	2.47			Paterson.....	7, 8	2.66		
Gadsden.....	18, 19	2.75			New York.				
Lineville.....	18	2.20			New York City.....	8	2.66	6.53	
University of Ala.....	18, 19	2.10			Do.....	12, 13	2.80		
Tusculum.....	6, 7	2.10			White Plains.....	7, 8	2.33		
Dakota.					Mountainville.....	7, 8	2.10		
Webster.....	7, 8	2.08	6.22		North Carolina.				
Yankton.....	12	2.08			Sallisbury.....	18, 19, 20	9.43	13.06	
Dist. of Columbia.					Lincolnton.....	18, 19, 20	8.30	11.96	
Washington City.....	7, 8	4.49	10.60		Charlotte.....	18, 19, 20	8.25	11.04	
Distrib'g Res'voir.....	8, 9	3.55	9.75		Flat Rock.....	18, 19	3.68	9.47	
Do.....	23	3.04			Statesville.....	18, 19, 20	5.65	8.91	
Kendall Green.....	7, 8	4.12	9.20		Kitty Hawk.....	1, 2	4.25	7.27	
Receiving Res'voir.....	8	2.40	8.56		Reidsville.....	19, 20	3.70	6.57	
Do.....	23	2.03			Lenoir.....	18, 19, 20	3.30	6.20	
Florida.					Wash Woods.....			6.00	
Live Oak.....	18, 19	3.82			Goldsbrough.....	31	2.24		
Georgia.					Ohio.				
Mossy Creek.....			9.81		College Hill.....	11, 12, 13	5.75	8.25	
Marietta.....			9.81		Columbus.....	12, 13	2.47	7.67	
Babun Gap.....			8.90		North Lewisburg.....	12, 13, 14	4.05	7.55	
Gainesville a.....			8.05		Jacksonborough.....			6.49	
Toccoa.....	18, 19	5.21	7.62		Yellow Springs.....	12, 13	4.32	6.27	
Athens a.....	18, 19, 20	5.85	7.44		West Milton.....	11, 12	4.50	6.00	
Gainesville b.....	18, 19	4.20	7.25		Cincinnati.....	11, 12	2.6		
Dahlonega.....			6.92		Pennsylvania.				
Athens b.....	18, 19, 20	5.43	6.84		Drifton.....	7, 8	3.95	8.00	
Augusta.....	18, 19	4.76	6.29		Catawissa.....	7, 8	2.98	7.19	
Atlanta.....	18, 19	4.76	6.21		Do.....	12, 13	2.19		
Camak.....	19, 20	3.92			Easton.....	7, 8	3.08	7.14	
Washington.....	18, 19, 20	3.70			West Chester.....	7, 8	3.71	7.00	
Jenau.....	19, 20	2.98			Quakertown.....	5, 6, 7	3.75	6.66	
Smithville.....	18, 19	2.03			Zionsville.....	7, 8	3.50		
Millen.....	19, 20	2.08			Dyberry.....	7, 8	2.80		
Waycross.....	18, 19, 20	3.14			Bethlehem.....	7, 8	2.83		
Savannah.....	30, 31	3.42			Blooming Grove.....	7, 8	3.40		
Alapaha.....	19, 20	3.41			South Carolina.				
West Point.....	18, 19	3.00			Spartanburg a.....	18, 19, 20	9.40	13.60	
Griffin.....	18, 19	4.54			Facolt.....	17 to 20	11.98	13.23	
Newnan.....	18, 19	3.40			Spartanburg b.....	18, 19, 20	8.67	11.99	
Forsyth.....	18, 19	3.41			Anderson.....	19, 20	8.22	10.39	
Indiana.					Columbia.....	19, 20	7.41	9.41	
Lafayette.....	12, 13	2.54	7.08		Greenville.....	18, 19, 20	5.87	8.36	
Sunman.....	10, 11, 12	3.19	6.09		Greenwood.....	18, 19, 20	6.95	8.28	
Spiceland.....	12	2.40			Chester.....	18, 19, 20	4.30	7.68	
La Grange.....	13, 14	2.00			Allemdale.....	20	2.41		
Logansport.....	14, 15	2.15			Batesburg.....	19, 20	3.05		
Iowa.					Blackville.....	20	2.84		
Oskaloosa.....	3, 4	2.44			Saint Georges.....	20	2.00		
Independence.....	9, 10	2.00			Branchville.....	20	2.05		
Monticello.....	8, 9	2.45			Cheraw.....	20	2.03		
Kansas.					Florence.....	20	2.24		
West Leavenworth.....	11	3.70	10.80		Kirkwood.....	20	3.88		
Do.....	13, 14	2.00			Stauburg.....	20	2.87		
Fort Scott.....	6	5.00	6.20		Tennessee.				
Wyandotte.....	11	2.02			Brownsville.....	5, 6, 7	6.63	8.52	
Maryland.					Greenville.....	28	6.80	7.80	
Fallston.....	7, 8	4.76	8.26		Caryville.....	5, 6, 7	3.15	7.72	
Great Falls.....	8, 9	2.00	7.77		Bolivar.....	5, 6, 7	3.50	7.56	
Do.....	23	2.20			Do.....	19, 20	3.50		
Woodstock.....	7, 8	4.00	7.36		Savannah.....	5, 6, 7	4.80	7.14	
Baltimore.....	6, 7, 8	4.17	7.07		Covington a.....	6, 7	3.41	7.05	
Fort McHenry.....	7, 8	3.80	6.86		Andersonville.....	5, 6	2.02	6.06	
McDonogh.....	7, 8	3.13			Chattanooga.....	6, 7	2.68		
Massachusetts.					Postoria.....	18, 19	2.50		
Williamstown.....	8	2.16			Cookville.....	5, 6	2.30		
Michigan.					Trenton.....	5, 6	2.17		
Kalamazoo.....	9, 10	2.27			Covington b.....	7, 8	3.65		
Thornville.....	14, 15	2.08			Texas.				
Mississippi.					Allen.....				
Edwards.....	18, 19	2.12			Brownsville.....	3	3.48	6.57	
Waynesborough.....	18, 19	2.60			Do.....	16, 17	2.94		
Missouri.					San Antonio.....	2	2.36		
Springfield.....	5, 6	6.20	9.30		Vermont.				
Do.....	29, 30	2.00			Newport.....	25, 26	2.11		
Saint Louis.....	14	3.33			Virginia.				
Pennsylvania.					Dale Enterprise.....	7, 8	4.04	12.66	
Pleasant Hill.....			6.65		Do.....	13, 14	2.94		
Sedalia.....			6.51		University of Va.....	7, 8	3.32	9.66	
Chamola.....			6.23		Accotink.....	7, 8	3.39	8.72	
Steelville.....			6.20		Drumright.....	31	2.15	8.64	
Lamar.....	5, 6	2.41			Norfolk.....	1, 2	3.42	8.32	
Warrensburg.....	11	2.30			Variety Mills.....	6, 7	3.49	8.22	
Nebraska.					Bird's Nest.....	31	2.35	7.70	
Marquette.....			6.27		Cape Henry.....	1	2.26	7.25	
New Jersey.					Lynchburg.....	7, 8	2.76	6.18	
Egg Harbor City.....	7, 8	3.45			Chincoteague.....			6.18	
Do.....	19, 20	2.06	15.07		West Virginia.				
Do.....	24	4.50			Holovia.....	7	2.12	7.08	
					Parkersburg.....	13	2.13		

Indiana.—Jeffersonville, 6th, 10th; Sunman and Knights-town, 10th; Spiceland, 12th; Logansport, 12th, 14th; Vevay, 12th, 23d; Indianapolis and La Grange, 23d.

Indian Territory.—Fort Reno, 14th.

Iowa.—Des Moines, 3d; Baneroff, 8th, 10th, 21st; Monticello, 8th, 12th; Logan and Independence, 8th, 12th, 22d; Keokuk and Clinton, 9th; Cresco, 15th; Oskaloosa, 16th.

Kansas.—Allison, 1st, 6th; Manhattan, 4th; Salina, 4th, 6th, 28th; Wakefield, 4th, 11th, 13th, 14th; Yates Centre and Fort Scott, 6th; Concordia and Lawrence, 11th; Wyandotte, 11th, 23d; Leavenworth and West Leavenworth, 13th; Independence and El Dorado, 14th; Ottawa, 23d.

Kentucky.—Frankfort, 13th; Richmond, 13th, 23d; Louisville, 23d.

Maine.—Kent's Hill, 30th.

Maryland.—Fort McHenry, 6th.

Michigan.—Thornville and Traverse City, 26th.

Missouri.—Conception, 3d, 8th; Warrenton, 5th; Springfield, 5th, 6th, 23d, 30th; Lamar, 6th, 14th; Saint Louis, 14th.

Montana.—Fort Benton, 1st; Fort Assinaboine, 1st, 6th; Helena, 7th, 8th; Fort Missoula, 10th; Fort Shaw, 10th, 12th; Poplar River, 11th; Fort Ellis, 12th, 13th; Fort Maginnis, 13th.

Nebraska.—North Platte, 1st; Omaha, 3d, 9th; Genoa, 9th; Crete, 9th, 22d; Marquette, 12th; Fort Sidney, 27th, 29th.

Nevada.—Carson City, 30th.

New Hampshire.—Woodstock, 20th.

New Jersey.—Beverly, 27th.

New Mexico.—Fort Union, 24th.

New York.—Albany, 22d, 30th; Ithaca and Humphrey, 25th; Mountainville, 26th.

North Carolina.—Reidsville, 12th; Flat Rock, 24th.

Ohio.—College Hill, 6th, 13th; Columbus, 10th; Cincinnati and Yellow Springs, 12th; Jacksonborough, 12th, 22d; Toledo, 23d, Westerville, Tiffin, Napoleon, and Fostoria, 24th.

Oregon.—Linkville and Pendleton, 8th.

Pennsylvania.—Grampian Hills, 10th; Drifton, 11th, 16th, 20th, 22d; Dyberry, 16th; Quakertown, 20th; Philipsburg, 23d; Pittsburg, 24th; Zionsville, 26th.

South Carolina.—Spartanburg, 6th, 22d, 24th, 28th.

Tennessee.—Austin, 6th; Knoxville, 10th, 24th; Paris, 14th; Nashville, 21st.

Texas.—Abilene, 1st.

Virginia.—Bird's Nest, 6th; Dale Enterprise, 6th, 11th; Variety Mills, 7th, 11th, 24th; Wytheville, 17th.

Washington Territory.—Fort Spokane, 8th; Bainbridge Island, 8th, 27th; Neah Bay, 14th; Tatoosh Island, 15th.

West Virginia.—Clarksburg, 12th.

Wisconsin.—Milwaukee, Evansville, and Fond du Lac, 15th.

SLEET.

Pike's Peak, Colorado, 13th, 21st, 28th.

Mount Washington, New Hampshire, 3d.

COTTON REGION REPORTS.

A system of temperature and rainfall observations was begun in the spring of 1882 in the cotton growing districts of the South. These observations have been continued since in each year from April to October, inclusive. This year the observations were not resumed until April 10th.

In the following table are given the average rainfall and the means of the maximum and minimum temperatures for the several districts, as shown on the chart issued with the REVIEW for April, 1882. For the purpose of comparison the averages for these districts during the four preceding years are also given. A comparison of these figures shows a great deficiency of rainfall in the districts of Galveston, Little Rock, New Orleans and Vicksburg, while in the districts of Atlanta and Augusta a marked excess occurs. The means of the maximum and minimum temperatures are higher than the normal in nearly all the districts, but the departures are slight, except in the districts of Little Rock and Galveston, where the means of the maximum temperature for May, 1886, exceeded the normal by more than 4°; and the means of the minimum temperatures exceeded the normal by 2°·5 for the district of Galveston, and by 4°·7 for the district of Little Rock:

Temperature and rainfall data for the cotton districts, May, 1886.

Districts.	Rainfall.			Temperature.								Extremes for May, 1886.	
	Average for May of four preceding years.	Average for May, 1886.	Departures.	Maximum.				Minimum.					
				Mean for May of four pre- ceding years.	Mean for May, 1886.	Departures.		Mean for May of four pre- ceding years.	Mean for May, 1886.	Departures.			
Inch.	Inch.	Inch.	°	°	°		°	°	°		°	°	
New Orleans.....	5.46	1.11	- 4.35	83.7	86.6	+ 2.9		62.6	65.2	+ 2.6		104	47
Savannah.....	3.12	2.89	- 0.23	85.5	85.8	+ 0.3		62.0	62.8	+ 0.8		99	44
Charleston.....	3.46	1.98	- 1.48	83.2	84.9	+ 1.7		59.5	58.9	- 0.6		98	40
Atlanta.....	3.02	5.95	+ 2.93	81.0	81.8	+ 0.8		56.4	58.3	+ 1.9		98	41
Wilmington.....	3.71	4.94	+ 1.23	79.2	83.1	+ 3.9		56.1	59.0	+ 2.9		98	40
Memphis.....	4.69	3.49	- 1.20	83.8	82.4	- 1.4		56.4	57.7	+ 1.3		97	30
Galveston.....	6.53	0.26	- 6.27	83.8	87.9	+ 4.1		62.2	64.7	+ 2.5		101	48
Vicksburg.....	5.79	1.87	- 3.92	82.0	84.7	+ 2.7		60.3	62.0	+ 1.7		97	41
Montgomery.....	3.23	3.36	+ 0.13	83.5	84.4	+ 0.9		58.7	59.3	+ 0.6		97	39
Augusta.....	3.17	5.42	+ 2.25	83.3	84.1	+ 0.8		58.8	60.1	+ 1.3		97	42
Little Rock.....	5.85	0.80	- 5.05	79.8	85.5	+ 5.7		65.3	66.0	+ 0.7		99	41
Mobile.....	3.96	2.47	- 1.49	83.3	85.1	+ 1.8		60.1	58.8	- 1.3		99	43

TEMPERATURE OF WATER.

The following table shows the highest and lowest temperatures of water observed at the several stations; the monthly ranges of water temperature; the average depth at which the observations were made; and the mean temperature of the air:

Temperature of water for May, 1886.

Station.	Temperature at bottom.		Range.	Average depth, feet and tenths.	Mean temperature of the air at station.
	Max.	Min.			
	°	°	°		°
Atlantic City, New Jersey.....	59.1	48.8	9.3	10.2	57.0
Alpena, Michigan.....	60.7	48.8	11.9	12.7	49.6
Augusta, Georgia.....	78.2	65.0	13.2	12.4	72.2
Baltimore, Maryland.....	66.3	52.6	13.7	11.0	61.9
Block Island, Rhode Island.....	55.2	46.2	9.0	8.5	53.5
Boston, Massachusetts.....	57.7	52.0	5.7	19.6	56.2
Buffalo, New York.....	57.4	46.6	10.8	10.1	53.1
Canby, Fort, Washington Territory.....	59.0	50.4	8.6	16.1	52.1
Cedar Keys, Florida.....	79.9	73.7	6.2	8.2	74.0
Charleston, South Carolina.....	77.5	67.6	9.9	38.2	72.8
Chicago, Illinois.....	64.4	46.0	18.4	8.5	57.0
Chincoteague, Virginia.....	71.5	53.9	17.6	3.0	59.6
Cleveland, Ohio.....	63.4	48.3	15.1	14.0	57.4
Detroit, Michigan.....	58.1	46.8	11.3	26.9	58.4
Duluth, Minnesota.....	39.9	36.1	3.8	10.9	52.2
Eastport, Maine.....	43.0	38.4	4.6	16.2	47.0
Escanaba, Michigan.....	56.9	42.0	14.9	18.4	50.0
Galveston, Texas.....	84.6	70.0	14.6	12.9	74.6
Grand Haven, Michigan.....	68.6	58.5	10.1	19.0	52.3
Indianola, Texas.....					
Jacksonville, Florida.....	82.7	74.5	8.2	18.0	75.8
Key West, Florida.....	86.5	76.5	10.0	17.6	78.9
Mackinaw City, Michigan.....	50.1	39.0	11.1	10.0	49.9
Macon, Fort, North Carolina.....	70.0	59.0	11.0	11.1	68.1
Marquette, Michigan.....	54.1	37.5	16.6	11.6	49.4
Milwaukee, Wisconsin.....	58.0	40.5	17.5	8.0	54.3
Mobile, Alabama.....	79.0	67.7	11.3	17.6	72.2
New Haven, Connecticut.....	61.0	51.0	10.0	16.8	56.6
New London, Connecticut.....	66.6	45.6	21.0	13.0	56.8
New York City.....	60.0	53.0	7.0	17.0	58.5
Norfolk, Virginia.....	71.2	56.0	15.2	16.4	65.0
Pensacola, Florida.....	76.9	69.1	7.8	17.5	73.8
Portland, Maine.....	52.7	43.3	9.4	16.2	53.1
Portland, Oregon.....	64.6	52.4	12.2	52.9	57.7
Sandusky, Ohio.....	69.2	57.4	11.8	11.3	59.5
Sandy Hook, New Jersey.....	64.3	50.0	14.3	11.8	57.9
San Francisco, California.....	62.3	56.5	5.8	37.3	57.8
Savannah, Georgia.....	77.2	68.0	9.2	10.0	75.0
Smithville, North Carolina.....	78.1	63.1	15.0	11.0	70.2
Toledo, Ohio.....	72.2	60.1	12.1	13.3	52.7
Wilmington, North Carolina.....	74.5	64.9	9.6	10.0	70.2

* Record for 30 days; lake too rough to take observation on the 7th. † Frozen first four days of month. Observations interrupted by ice in bay 7th to 10th, 12th, 13th, 15th, 20th, 21st. ‡ Observations temporarily suspended. § Record for the first 20 days.

WINDS.

The most frequent directions of the wind during May, 1886, are shown on chart ii by the arrows flying with the wind; they are also given in the tables of miscellaneous meteorological data. In the lower lake region, the south Atlantic and east Gulf states, the prevailing direction of the wind is from the southwest, in the west Gulf states and Texas it is from the south and southeast. In the Extreme Northwest and the Upper Mississippi Valley the winds are generally from the north and northwest; in other districts they are variable.

HIGH WINDS.

[In miles per hour.]

Wind-velocities of fifty or more miles per hour were reported during the month as follows:

Mount Washington, New Hampshire, 59, nw., 4th; 80, w., 5th; 54, w., 9th; 60, w., 10th; 58, se. and e., 11th; 50, w., 12th; 82, s., 15th; 88, s., 16th; 62, nw., 17th; 54, nw., 19th; 78, nw., 20th; 62, nw., 21st; 70, w., 22d; 54, w., 23d; 70, w., 25th; 80, nw., 26th; 58, nw., 27th; 50, nw., 28th; 60, nw., 29th; 58, nw., 30th.

Pike's Peak, Colorado, 60, w., 1st; 60, sw., 3d; 74, w., 5th; 68, w., 8th; 66, w., 9th; 56, w., 10th; 72, sw., 13th; 52, w., 31st.

Valentine, Nebraska, 54, e., 9th.

Kitty Hawk, North Carolina, 56, n., 1st.

Cape Henry, Virginia, 60, nw., 1st; 54, n., 2d.

Chincoteague, Virginia, 50, ne., 1st.

LOCAL STORMS AND TORNADOES.

La Plata, Macon county, Missouri: a heavy wind storm prevailed here on the night of the 4-5th. Orchards, fences, and small houses were leveled to the ground, and cattle killed. Owing to the violence of the storm many persons sought refuge in cellars.

Woodstock, McHenry county, Illinois: the portion of country lying between the towns of Ringwood and McHenry, in this county, was visited on the 6th by a tornado, which was very disastrous to farmers in the small area over which it passed. At noon the atmosphere was clear and warm, temperature rising until about 2 p. m., when the sky to the north became overcast with heavy black clouds; the sultry air suddenly began to get very cool, the mercury falling several degrees in a few minutes. The northern clouds grew blacker and moved southward, and the lull which had followed the first cool breeze was suddenly broken by the roar of the tornado. Trees bent before the blast like grain, and the smaller ones were snapped in pieces or twisted from the earth by the roots. The air was filled with flying limbs, pieces of boards, and other objects. Two men were killed, and several persons injured.

Oskaloosa, Mahaska county, Iowa: on the 9th, a violent wind storm did considerable damage to property; houses were unroofed, trees and fences blown down, and the amphitheatre in the fair grounds was wrecked.

Pittsburg, Pennsylvania: reports from points along the Conemaugh Valley, in Indiana county, indicate the occurrence of a tornado in that section on the evening of the 10th. Several persons were seriously injured. Descriptions of this tornado say that telegraph poles along the railroad were blown down, cows were killed and trees were blown fully two hundred feet in the air, while many fences and small buildings were destroyed.

McConnellsburg, Indiana county, Pennsylvania: the Methodist Episcopal church was struck by lightning during the evening of the 10th and considerably damaged. Two men engaged in burning lime were prostrated by a bolt of lightning and two horses killed.

Blairsville, Indiana county, Pennsylvania: a heavy hail storm passed over this place about 6 p. m. of the 10th, and was followed by a tornado which swept from Salina along the valley of the Conemaugh River to Coketown, cutting down trees and destroying numerous outhouses and barns. It caused the water in the river to rise to the height of seventy-five feet, in the form of an inverted water-spout, which revolved about a moving centre, travelling across and up the stream until it reached the new Coketown bridge, an iron structure five hundred and twenty feet long, which was damaged to the extent of \$5,000. The tornado left the river at this point and continued across the country, blowing down telegraph poles, trees, smoke-stacks, and barns. Near Conemaugh a number of freight cars were standing on a siding; the tornado lifted them bodily from the track and dashed them to the ground.

Kansas City, Missouri: a very disastrous tornado occurred at